CHAPTER 13. NET NATIONAL EMPLOYMENT

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13.1 NET NATIONAL EMPLOYMENT

Net national employment impacts from clothes washer standards are defined as net jobs created or eliminated in the general economy as a consequence of: (1) reduced spending by end users on energy (electricity, gas including LPG, and oil) and water; (2) reduced spending on new energy supply by the utility industry; (3) increased spending on the purchase price of new clothes washers; and (4) the associated indirect effects of those three factors throughout the national economy.

Figure 13.1 shows the estimated net national employment impacts of six different trial clothes washer standard levels, including five with efficiency improvements ranging from a Modified Energy Factor (MEF) of 1.021 to a MEF of 1.634, plus a two-tier negotiated standard level implementing a 1.04 MEF in the year 2004 and a 1.26 MEF level in 2007. These standard levels are defined in greater detail in the Engineering chapter. Figure 13.1 shows, for any given year, the change in the number of jobs in the economy relative to the case of no new standard. The different scenarios are identified by both MEF and the proposed standard levels as numbered in the NOPR.

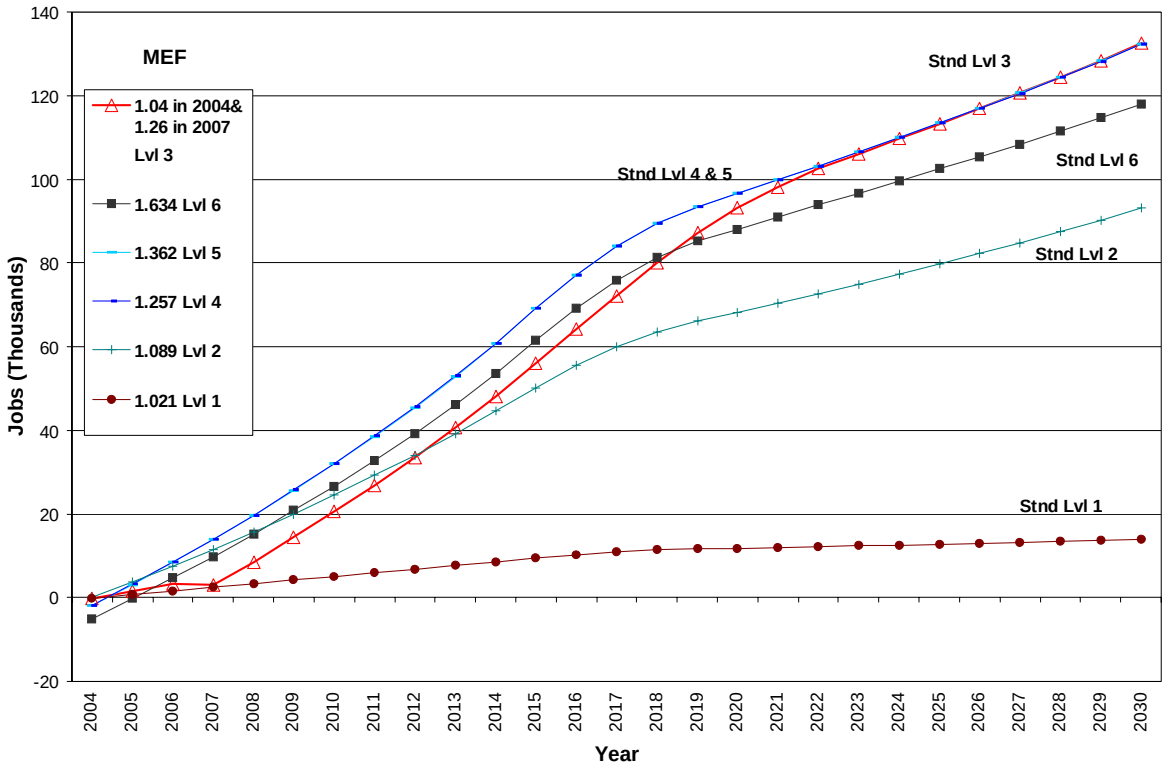

Figure 13.1 Net National Employment Impacts

These results are based on an input/output model of the U.S. economy that estimates the effects of standards on major sectors of the economy related to buildings and the net impact of standards on jobs. The model, ImBuild, was developed by the Office of Building Technology, State and Community Programs.[1] ImBuild is a PC-based economic analysis model that characterizes the interconnections among 35 sectors as national input/output structural matrices. It can be applied to future time periods. ImBuild calculates the total effect on employment, including job creation or deletion in the manufacturing sector. Direct employment impacts, those that would occur at clothes washer manufacturing plants, are discussed in the Manufacturer Impact Analysis chapter.[a]

Figure 13.1 shows the cumulative increase/decrease in jobs for each year to the year 2030. The greatest number of jobs is created for standard level 4 or 1.257 MEF in clothes washer efficiency; in this case there would be 142,800 more jobs in 2030 than if there were no efficiency standard implemented.

Jobs are created when a clothes washer standard results in operating cost savings that more than offset the greater capital required to buy a more efficient clothes washer. Energy and water savings (lower operating costs) are based on the difference in energy and water consumption between scenarios of a standards case and a base case.

Figure 13.1 can be divided into three general sections:

1) In the first few years of a new standard, the increased costs of buying more efficient clothes washer are greater than the initial dollar savings in energy and water. In Figure 13.1, this is reflected as a net decrease in jobs for some of the standard levels.

2) Once the initial costs are recovered by energy and water savings, the dollars saved in expenditures on energy and water are available to buy other goods in the economy, thereby increasing jobs. The net national employment curve is steepest for the first 17 years (the maximum life of a washer) as the existing clothes washers are replaced by clothes washers that have a higher efficiency.

3) After 17 years, even though the total stock in clothes washers continues to increase with the population, the growth in net employment tapers off because at that point all of the washers being replaced in the standards case are replacing washers that are already high efficiency (instead of replacing a baseline washer with a high efficiency washer).

The total impact on jobs is composed of several components:
- consumer savings in energy and water (Figure 13.2)
- increased costs for clothes washers (Figure 13.3)

[a]The direct employment impacts will be based on direct interviews and output from a spreadsheet model called GRIM.

- effects on the energy supply sector (Figure 13.4)

Figure 13.2 shows the impact of reduced consumer spending for energy and water savings on jobs. When more consumers save money by using efficient washers, they have more money to spend on other sectors of the economy and this results in an increase in jobs. The magnitude of the impact increases over time as more old washers are replaced with the new, more efficient washers.

The effect on employment for water and wastewater utilities is estimated to have twice the impact per million dollars saved as is estimated for electric utilities. Because water & wastewater utilities are not included in the ImBuild code, the water & wastewater utility effect is accounted for by doubling the dollar amount saved for water and adding this amount to the utility sector dollar savings. Notice that in Figure 13.2 the 2 Tier MEF (level 3) , 1.257 MEF (level 4) and 1.362 MEF (level 5) standards result in more jobs that the higher standard of 1.634 MEF (level 6). This is because the engineering data used showed that the 1.634 MEF level had lower water savings than the 1.257 and 1.362 levels. This combined with the estimate of each million dollars of water savings affecting twice the jobs as for a million dollar savings of electricity, resulted in an overall increase in jobs for a lower standard level.

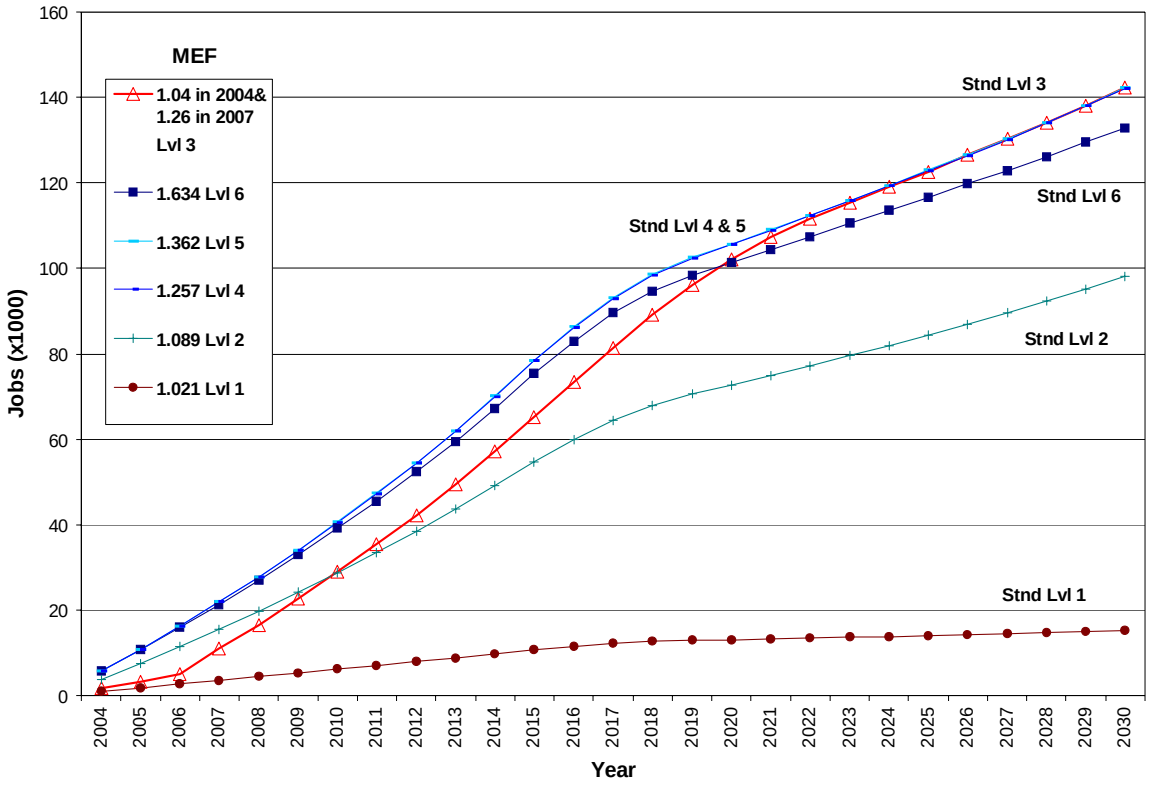

Figure 13.2 Employment Impacts of Consumer Energy and Water Savings

Figure 13.3 shows the employment impacts due to the increased price of more efficient clothes washers. The standards typically cause manufacturers of the regulated products to incur additional costs. That additional investment in turn transfers spending from other sectors of the economy into the appliance manufacturing sector. Depending upon the relative mix of labor and capitol in the affected industry compared to the rest of the economy, jobs can be created or eliminated. In the case of clothes washers, increased investment in the appliance industry is typically expected to eliminate jobs, because appliance manufacturing is more capital intensive than average. In addition, appliance manufacturers and related businesses (e.g., suppliers) may eliminate some jobs to reduce their costs. Finally, the transfer in consumer spending from other items to pay for the increased price of clothes washers is also expected to eliminate jobs. All these effects are included in the employment impacts of incremental clothes washer price.

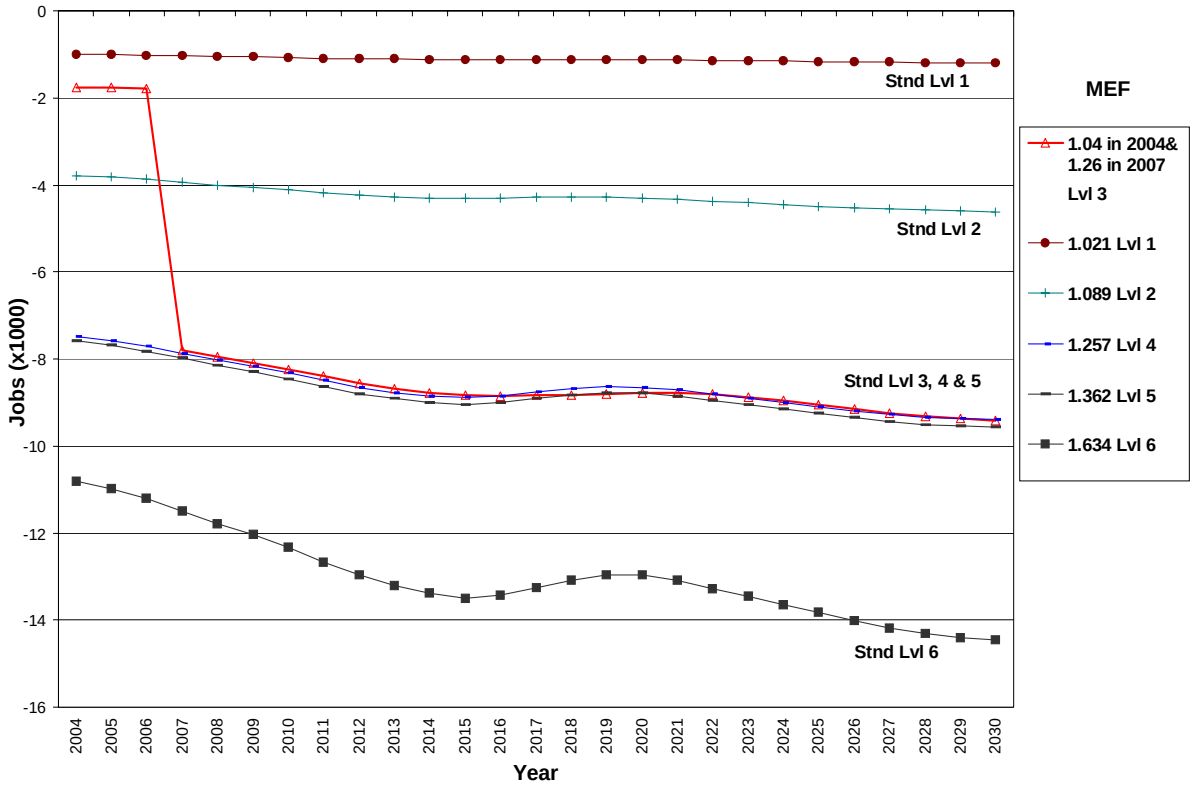

Figure 13.3 Employment Impact of Incremental Clothes Washer Price

Figure 13.4 shows the decrease in employment in the energy supply sector due to reductions in revenues as consumers achieve energy savings. Revenue loss by utilities is expected to result in lower employment by utilities. Limitations to the model prevent consideration of possible job losses by water utilities. We assume that there is neither an increase or decrease in water utility related employment.

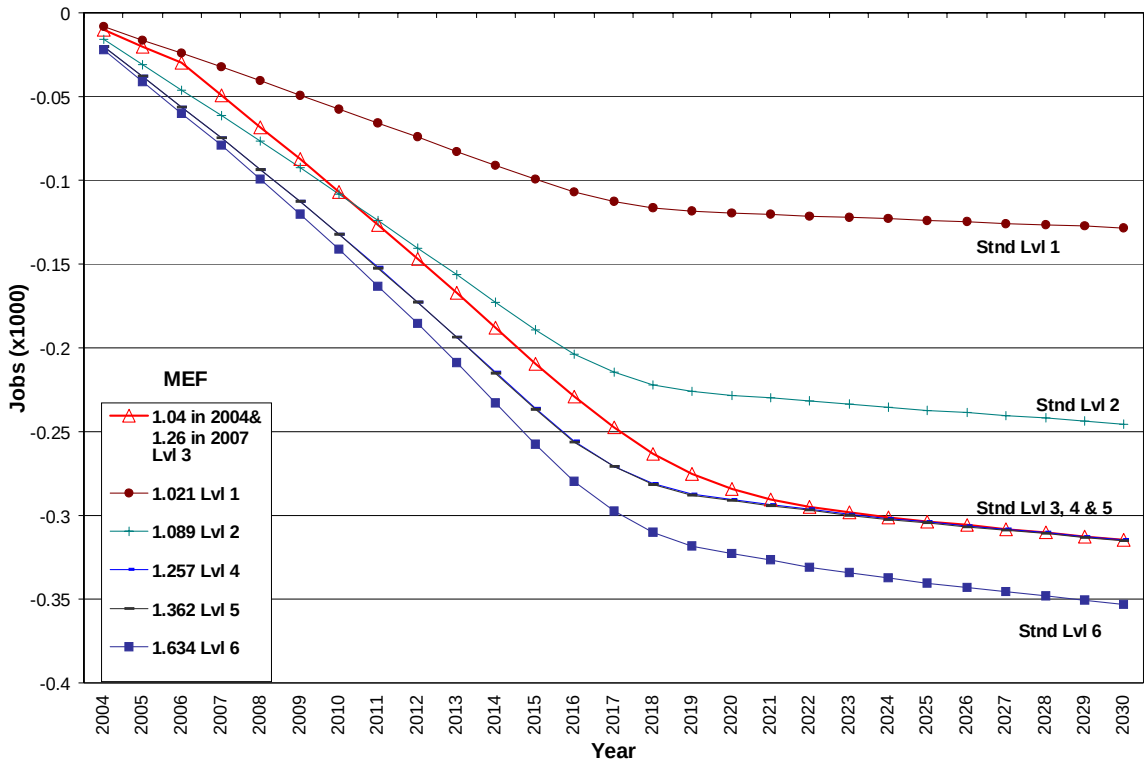

Figure 13.4 Employment Impacts in Energy Supply Sector

In summary, the consumer savings from reduced energy and water bills create jobs and represent the largest impact of standards on employment. The increased price of clothes washers and reduced revenues to utilities eliminate jobs. The net effect is job creation.

13.2 INPUTS TO NET NATIONAL EMPLOYMENT SPREADSHEET

The impacts of new clothes washer standards are estimated in the National Energy Savings (NES) spreadsheet as operating cost savings (energy and water cost savings) and increased clothes washer purchase price. These two impacts (see Figures 13.5 & 13.6 below) are output from NES and input to the calculation of Net National Employment (ImBuild model).

Figure 13.5 shows the annual increase in national consumer expenditures to pay for more efficient clothes washers, for each of the possible standard levels (1.021 MEF - 1.634 MEF).

Figure 13.6, 13.7 and 13.8 show the national savings in consumer energy bills for each possible standard level (1.021 MEF - 1.634 MEF). Comparing the savings in Figure 13.6 to the increased costs in Figure 13.5, the savings exceed the costs after a few years.

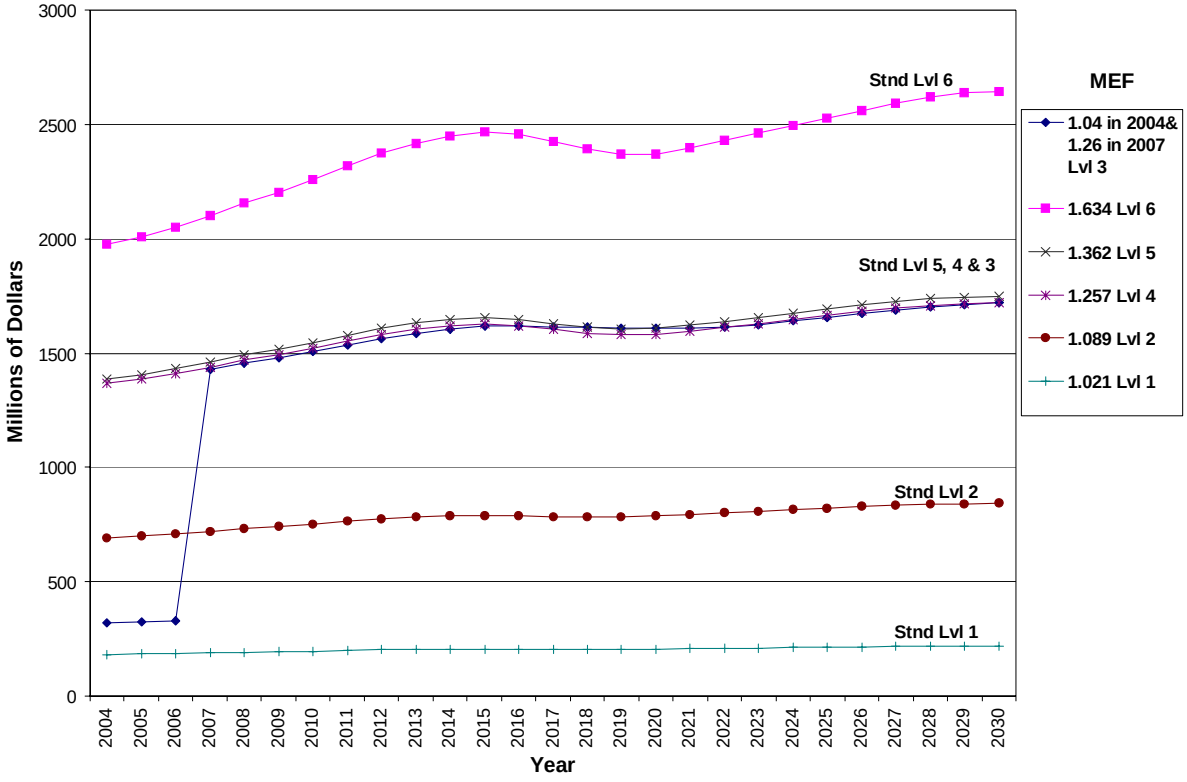

Figure 13.5 Projected Increase in U.S. Consumer Expenditures to Purchase Clothes Washers After Standards

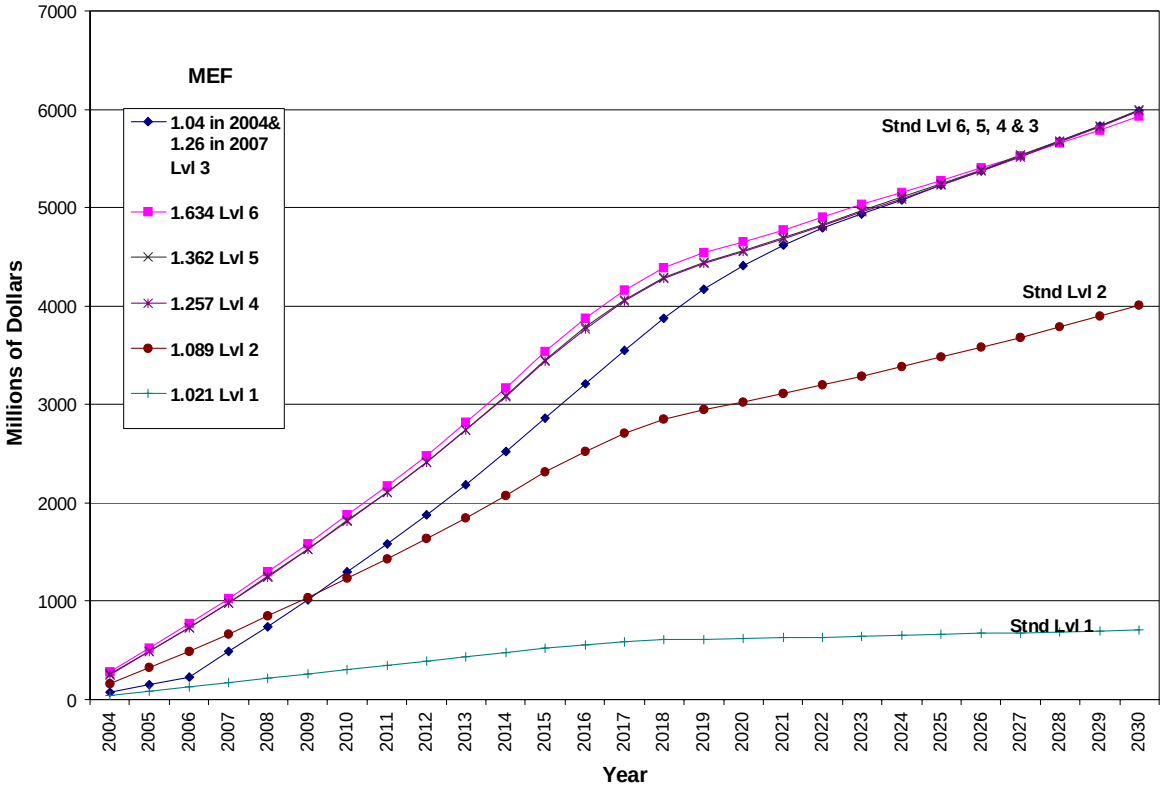

Figure 13.6 Projected U.S. Consumer Savings in Electricity Bills: Energy Efficiency Standards on Clothes Washers

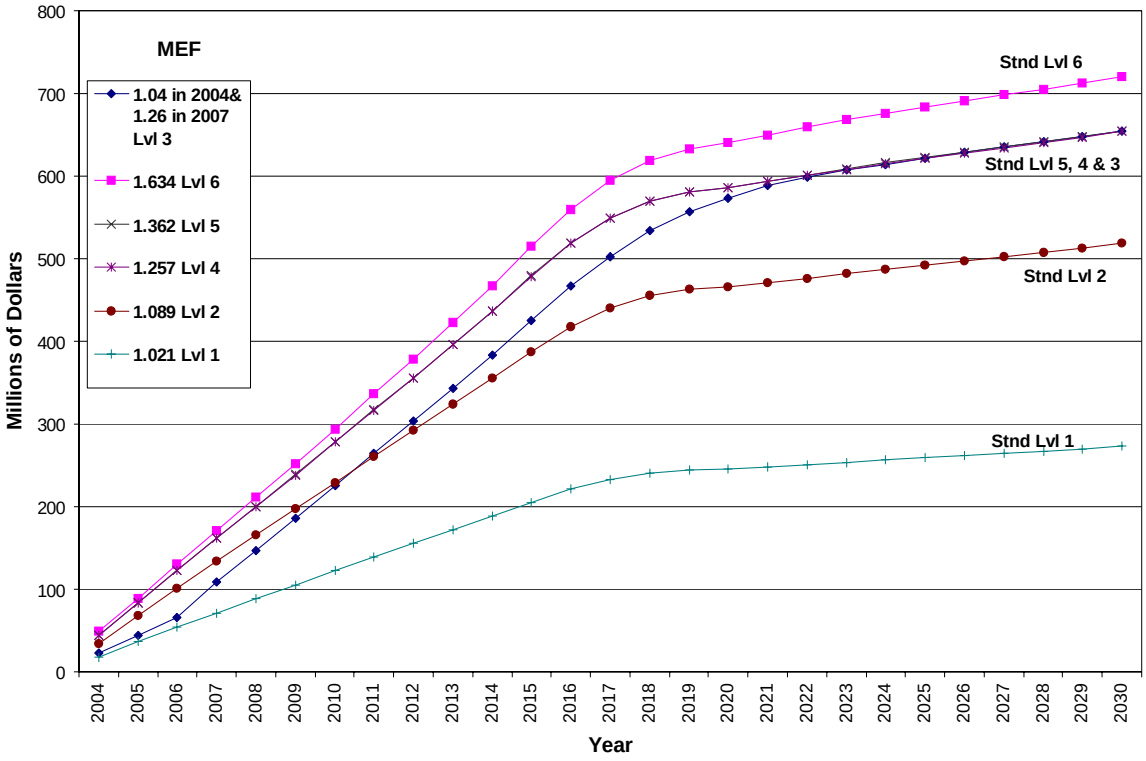

Figure 13.7 Projected U.S. Consumer Savings in Natural Gas Bills: Energy Efficiency Standards on Clothes Washers

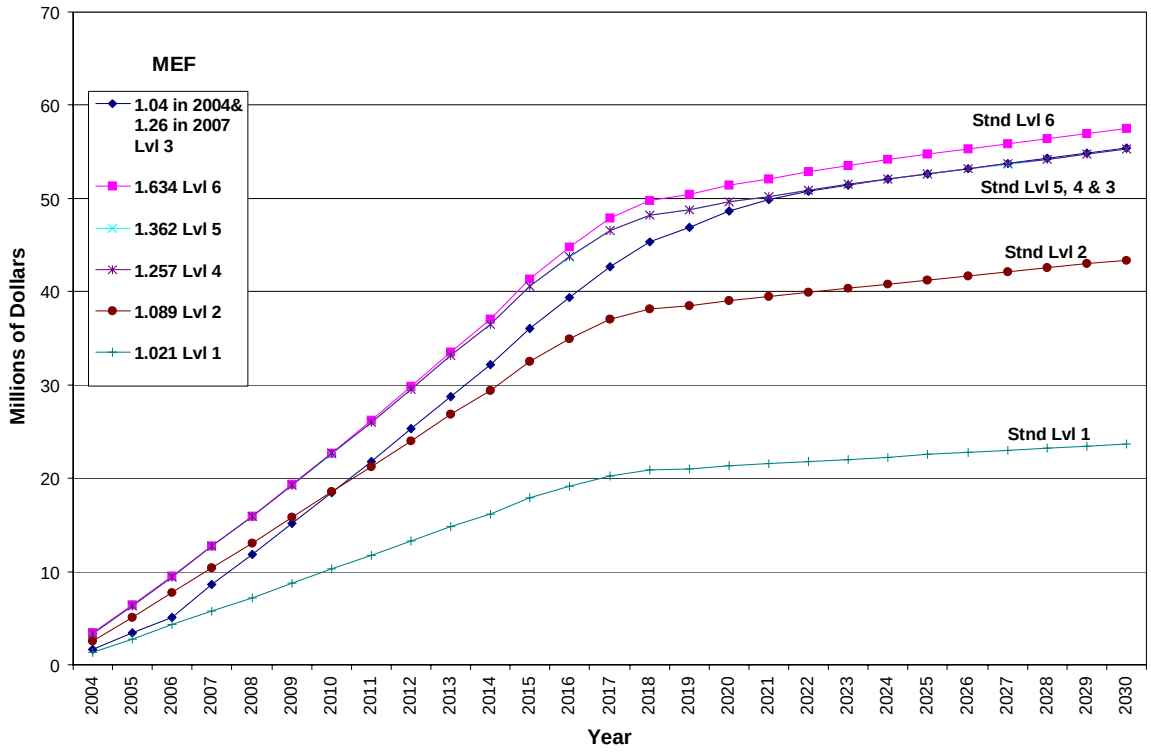

Figure 13.8 Projected U.S. Consumer Savings in Oil Bills: Energy Efficiency Standards on Clothes Washers

Figures 13.9, 13.10, 13.11 show the energy savings in trillions of Btu for each of the three fuel sources; electricity, natural gas, and oil. The data provided is expressed as site source energy (that is, energy provided to the customer). This data is output from the NES analysis and input into the ImBuild model which then estimates the effect on jobs in the energy supply sector.

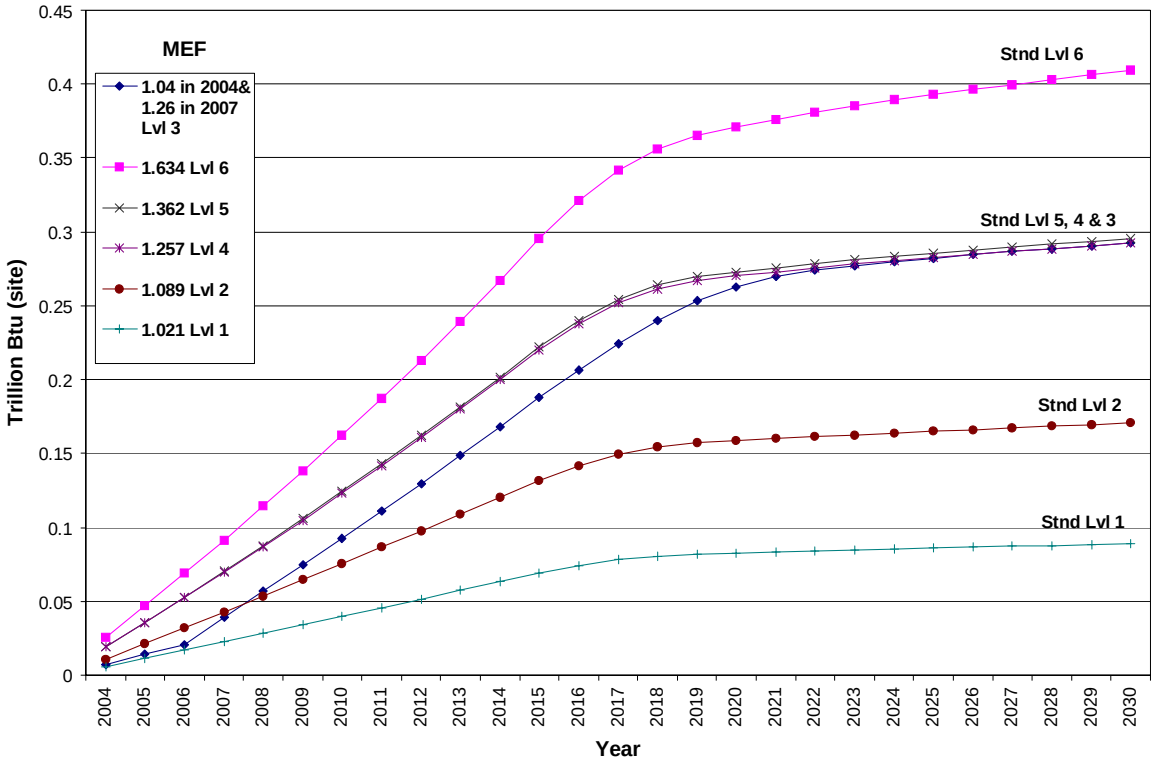

Figure 13.9 Projected Savings due to Clothes Washer Standards: Residential Electricity

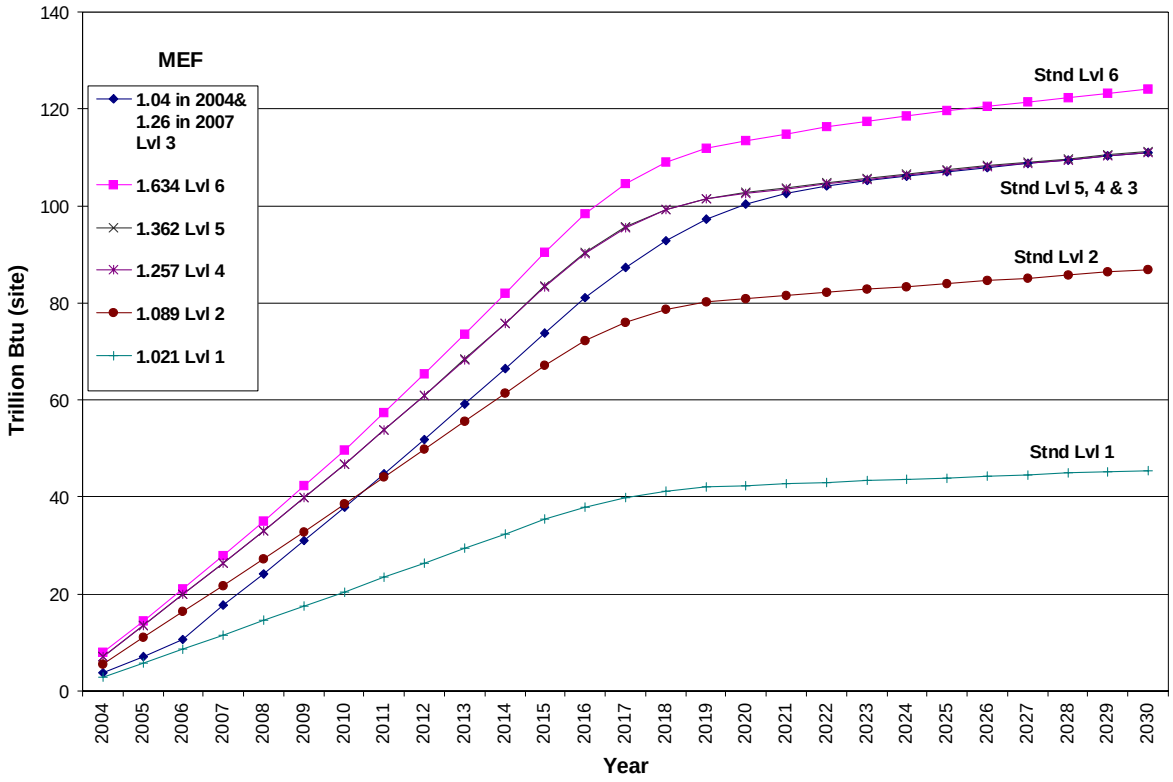

Figure 13.10 Projected Savings due to Clothes Washer Standards: Residential Natural Gas (including LPG)

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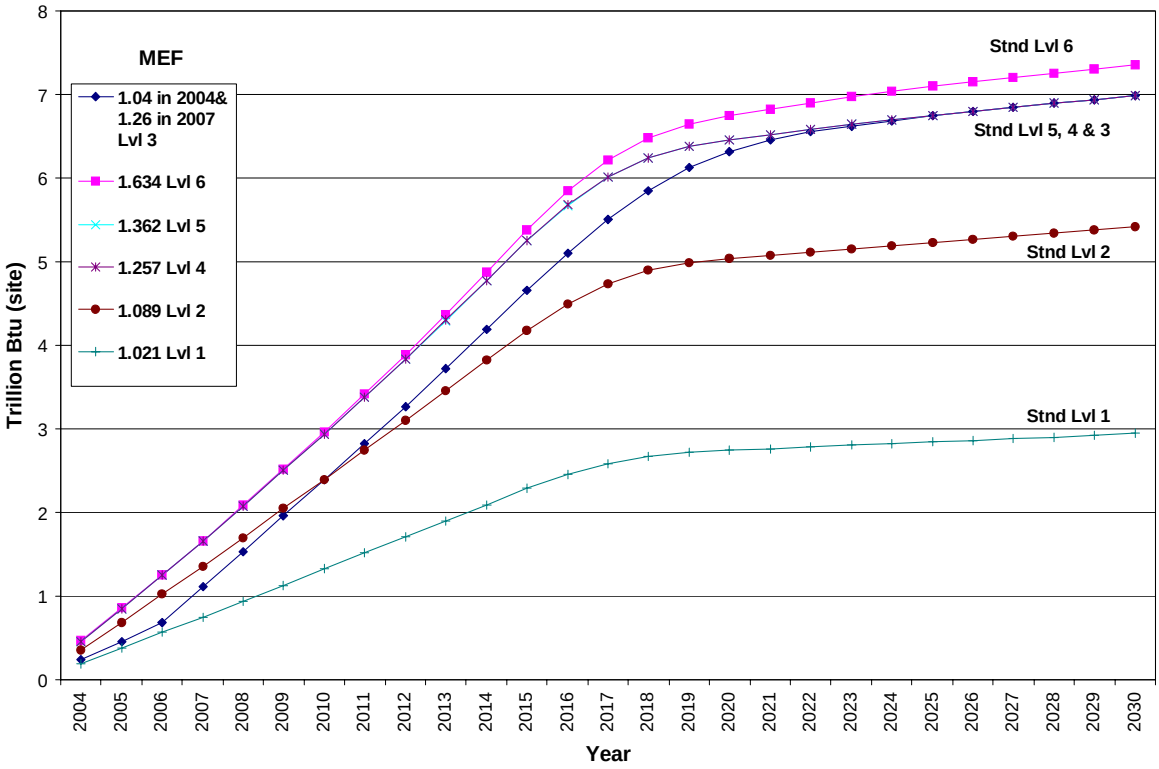

Figure 13.11 Projected Savings due to Clothes Washer Standards: Residential Oil

REFERENCE

1. Scott, M. J., D. J. Hostick, and D. B. Belzer, *ImBuild: Impact of Building Energy Efficiency Programs,* April, 1998, Pacific Northwest National Laboratory. Richland, WA. Prepared for the U.S. Department of Energy under Contract DE-AC06-76RLO 1830. Report No. PNNL-11884.